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10/073,710	02/11/2002	Jes Asmussen	MSU 4.1-572	5422
21036	7590	05/08/2006	EXAMINER	
MCLEOD & MOYNE, P.C. 2190 COMMONS PARKWAY OKEMOS, MI 48864			FULLER, ERIC B	
			ART UNIT	PAPER NUMBER
			1762	

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

**MAILED**

Application Number: 10/073,710

MAY 08 2006

Filing Date: February 11, 2002

Appellant(s): ASMUSSEN ET AL.

**GROUP 1700**

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Ian C. McLeod  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed February 21, 2006 appealing from the Office action mailed November 21, 2005.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,592,839	GRUEN et al.	7-2003
5,311,103	ASMUSSEN et al	5-1994

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5,273,790	HERB et al.	12-1993
4,906,900	ASMUSSEN et al	3-1990
4,727,293	ASMUSSEN et al	02-1988
4,585,668	ASMUSSEN et al	04-1986

**(9) Grounds of Rejection**

The following grounds of rejection are applicable to the appealed claims:

Claims 1-5, 8-12, 14-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen et al. (US 6,592,839) in view of Asmussen et al. (US 5,311,103).

Gruen teaches a method of forming a nanocrystalline diamond film by plasma CVD. The grain size is taught in column 4, line 35. The plasma is formed by radiofrequency and or microwave (column 4, lines 5-15). It is explicitly taught to exclude oxygen and other gases (column 4, lines 15-20). It is taught in many embodiments to use only argon as the only inert gas (column 4, line 24-30; table 1), which reads on excluding nitrogen. The argon is used in the claimed concentration (column 8, lines 1-10). The pressure reads on the applicant's claimed pressure range (column 4, line 40-47). The nucleation step reads on roughening the substrate (column 4, lines 50-65). The temperature is taught in column 4, line 61. The reference does not explicitly teach performing the plasma CVD process in the claimed apparatus.

However, Asmussen teaches an apparatus for depositing diamond films on silicon substrates (abstract). The apparatus reads on the applicant's claims (column 12, lines 7-47). The benefits of using the apparatus is that it is economical to construct and

reliable to use and produces excellent results (column 5, lines 1-5). Additionally, the tunable features allow for efficient use, as extra plasma requiring extra power is not produced. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the apparatus of Asmussen to perform the method of Gruen. By doing so, one would reap the benefits of efficient use, economical construction, a reliable apparatus, and excellent results.

Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen et al. (US 6,592,839) in view of Asmussen et al. (US 5,311,103), as applied to claims 1 and 2 above, in further in view of Herb et al. (US 5,273,790).

Gruen, in view of Asmussen, teaches the limitations of claims 1 and 2, as shown above, but fails to teach using molybdenum as the substrate holder. However, Herb teaches that the holder should be fabricated from materials chosen to exclude carbon, in order to eliminate a potential uncontrollable source of carbon. Materials suitable for use include molybdenum (column 6, lines 61-65). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize molybdenum as the substrate holder. By doing so, one would reap the benefits of preventing uncontrollable sources of carbon.

Claims 1-5, 8-12, 14-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen et al. (US 6,592,839) in view of Asmussen et al. (US 4,585,668).

Gruen teaches the limitations above, but fails to explicitly teach performing the plasma CVD process in the claimed apparatus.

However, Asmussen teaches an apparatus that reads on the applicant's claims (column 13, lines 5-44). The benefits of using the apparatus is that it is economical to construct and reliable to use and produces excellent results (column 6, lines 60-68). Additionally, the tunable features allow for efficient use, as extra plasma requiring extra power is not produced (column 10, lines 29-35). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the apparatus of Asmussen to perform the method of Gruen. By doing so, one would reap the benefits of efficient use, economical construction, a reliable apparatus, and excellent results.

Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen et al. (US 6,592,839) in view of Asmussen et al. (US 4,585,668), as applied to claims 1 and 2 above, and further in view of Herb et al. (US 5,273,790).

Gruen, in view of Asmussen, teaches the limitations of claims 1 and 2, as shown above, but fails to teach using molybdenum as the substrate holder. However, Herb teaches that the holder should be fabricated from materials chosen to exclude carbon, in order to eliminate a potential uncontrollable source of carbon. Materials suitable for use include molybdenum (column 6, lines 61-65). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize molybdenum as the substrate holder. By doing so, one would reap the benefits of preventing uncontrollable sources of carbon.

Claims 1-5, 8-12, 14-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen et al. (US 6,592,839) in view of Asmussen et al. (US 4,906,900).

Gruen teaches the limitations above, but fails to teach performing the plasma CVD process in the claimed apparatus.

However, Asmussen teaches an apparatus that reads on the applicant's claims (column 10, lines 9-49). The benefits of using the apparatus is that it is economical to construct and reliable to use and produces excellent results (column 1, lines 59-68). Additionally, the tunable features allow for efficient use, as extra plasma requiring extra power is not produced. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the apparatus of Asmussen to perform the method of Gruen. By doing so, one would reap the benefits of efficient use, economical construction, reliable apparatus, and excellent results.

Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen et al. (US 6,592,839) in view of Asmussen et al. (US 4,906,900), as applied to claims 1 and 2 above, and further in view of Herb et al. (US 5,273,790).

Gruen teaches the limitations of claims 1 and 2, as shown above, but fails to teach using molybdenum as the substrate holder. However, Herb teaches that the holder should be fabricated from materials chosen to exclude carbon, in order to eliminate a potential uncontrollable source of carbon. Materials suitable for use include

molybdenum (column 6, lines 61-65). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize molybdenum as the substrate holder. By doing so, one would reap the benefits of preventing uncontrollable sources of carbon.

Claims 1-5, 8-12, 14-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen et al. (US 6,592,839) in view of Asmussen et al. (US 4,727,293).

Gruen teaches the limitations above, but fails to teach performing the plasma CVD process in the claimed apparatus.

However, Asmussen teaches an apparatus that reads on the applicant's claims (column 14, lines 5-44). The benefits of using the apparatus is that it is economical to construct and reliable to use and produces excellent results (column 1, lines 35-45). Additionally, the tunable features allow for efficient use, as extra plasma requiring extra power is not produced. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the apparatus of Asmussen to perform the method of Gruen. By doing so, one would reap the benefits of efficient use, economical construction, reliable apparatus, and excellent results.

Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen et al. (US 6,592,839) in view of Asmussen et al. (US 4,727,293), as applied to claims 1 and 2 above, and further in view of Herb et al. (US 5,273,790).

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Gruen, in view of Asmussen, teaches the limitations of claims 1 and 2, as shown above, but fails to teach using molybdenum as the substrate holder. However, Herb teaches that the holder should be fabricated from materials chosen to exclude carbon, in order to eliminate a potential uncontrollable source of carbon. Materials suitable for use include molybdenum (column 6, lines 61-65). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize molybdenum as the substrate holder. By doing so, one would reap the benefits of preventing uncontrollable sources of carbon.

Claims 1-5, 8-12, 14-17, and 19 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, and 4 of U.S. Patent No. 4,585,668 in view of Gruen et al. (US 6,592,839)

Claims 1, 2, and 4 of the patent teaches the applicant's claimed method steps, but fails to claim depositing diamond. However, Gruen teaches a diamond deposition process that requires plasma CVD. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to perform the diamond deposition of Gruen by the method of the U.S. Patent. By doing so, one would have a reasonable expectation of success, as the patent teaches a plasma deposition process and Gruen requires plasma deposition.

Claims 1-5, 8-12, 14-17, and 19 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 22-27 of U.S. Patent No. 4,585,668 in view of Gruen et al. (US 6,592,839)

Claims 22-27 of the patent teaches the applicant's claimed method steps, but fails to claim depositing diamond. However, Gruen teaches a diamond deposition process that requires plasma CVD. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to perform the diamond deposition of Gruen by the method of the U.S. Patent. By doing so, one would have a reasonable expectation of success, as the patent teaches a plasma deposition process and Gruen, requires plasma deposition.

#### **(10) Response to Argument**

Applicant argues that Gruen fails to teach the exclusion of oxygen or nitrogen in the gas mixture. This is not found convincing. Column 4, lines 16-20, explicitly teaches to exclude oxygen from the hydrocarbon. It is obvious that if oxygen is excluded from the hydrocarbon and not taught to be included anywhere else in the process, that one would not include oxygen in the process taught by Gruen. Regardless, the examiner does not need to rely on obviousness to teach this claimed feature. Table 1 shows 8 different embodiments where argon, hydrogen, and methane are all taught as the ONLY species being fed to the reactor (the amounts add up to 100%), this anticipates the claimed feature of excluding oxygen and nitrogen. The reference teaches embodiments

of only argon, hydrogen, and methane, why would anyone think that this means to include oxygen and nitrogen?

Applicant argues that since Gruen teaches that the inert may be argon, it fails to explicitly teach not including nitrogen. This is not found convincing. Gruen teaches that nitrogen may be used in column 4, lines 25-32, but also teaches that the inert gas may be only argon. As shown above, table 1 anticipates the feature of excluding oxygen and argon. Since the reference explicitly teaches embodiments where oxygen and nitrogen are not used, this reads on the applicant's claims. Further, it is noted that the claims read to exclude oxygen or nitrogen. The reference certainly reads on excluding oxygen, which is sufficient to read on the claims.

From the applicant's arguments, it appears that the entire inventive concept of the application is to minimize contaminates. The claims read to minimize contamination, but don't actually claim any steps that are used to ensure that contamination is minimized besides not having any leaks. This is not a patentable concept.

Applicant argues that Asumessen does not disclosed to be "essentially free of leaks". This is not found convincing. The apparatus is not taught to have leaks, thus it does not have leaks. One would not be motivated to add leaks.

It is further noted that the claims read that the process is "essentially" free of oxygen or nitrogen and "essentially" free from leaks. This implies that some oxygen and nitrogen may be present and some leaks may exist, as long as they do not materially affect the process. Since Gruen teaches embodiments (table 1) where oxygen and

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nitrogen are not included, and are not taught to materially affect the process, and Asmussen teaches a reactor and does not teach leaks that materially affect the process, the references read on the applicant's claims.

Applicant argues that although Herb teaches molybdenum substrate holders, it not taught in the claimed process. Herb teaches that in diamond coating processes involving hydrocarbons, the holder should be fabricated from materials chosen to exclude carbon, in order to eliminate a potential uncontrollable source of carbon. Materials suitable for use include molybdenum (column 6, lines 61-65). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize molybdenum as the substrate holder. By doing so, one would reap the benefits of preventing uncontrollable sources of carbon. Additionally, silicon carbide is taught as an art recognized suitable substrate coating.

Applicant's arguments against the double patenting rejections fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. The applicant has simply states that the present invention represents an improvement not disclosed or suggested or claimed in the references, but has not specifically argued what features are considered an improvement that are not taught by the references.

All other arguments are duplications of the above arguments. They are not found convincing for the reasons set forth above.

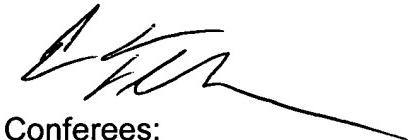
**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

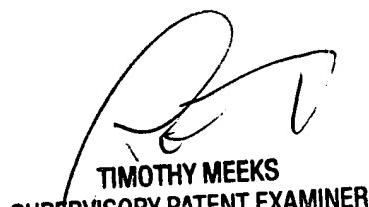
Eric B. Fuller



Conferees:

Tim Meeks

Glenn Caldarola



TIMOTHY MEEKS  
SUPERVISORY PATENT EXAMINER



Glenn Caldarola  
Supervisory Patent Examiner  
Technology Center 1700